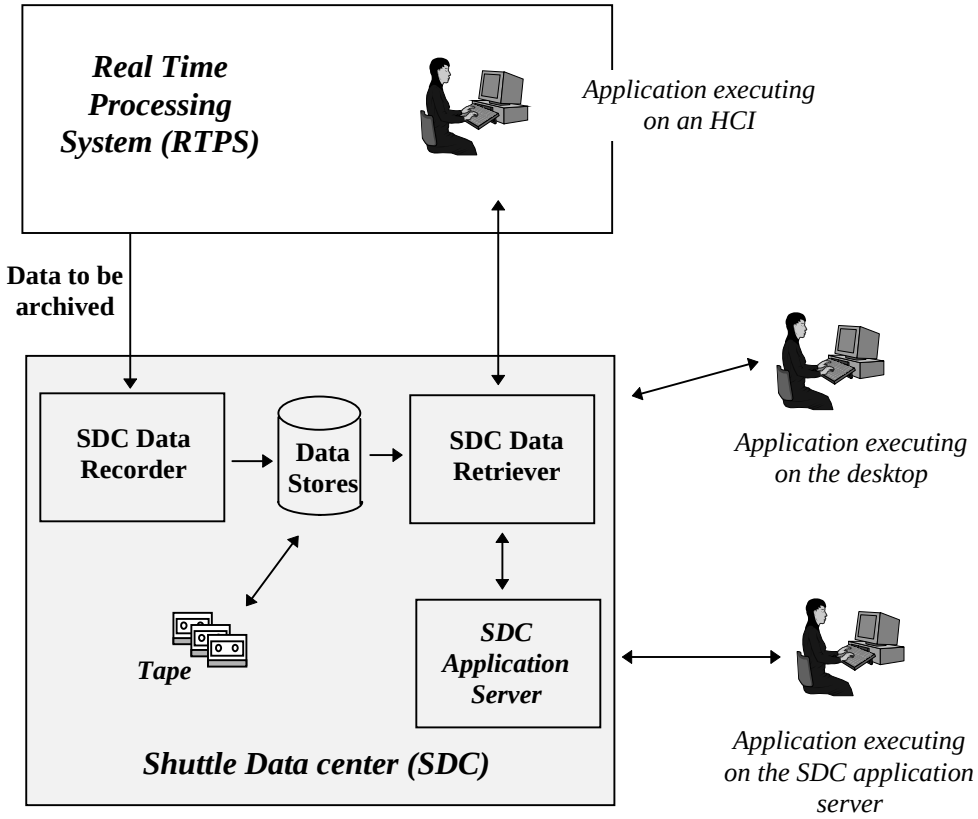
1. Data Recording/Archival and Retrieval

1.1 Data Recording/Archival and Retrieval Introduction

1.1.1 Data Recording/Archival and Retrieval Overview

The Data Recording/Archival and Retrieval CSCI resides in the Shuttle Data Center (SDC) and provides the capability to record and retrieve change data and message data. For Redstone the capability to retrieve change data will be available. Access to the data is not restricted and requests may come from many sources. The following diagram depicts the relationship between the SDC, RTPS and the applications using the SDC as a data source.



1.1.2 Recording/Archival and Retrieval Operational Description

The following operational description applies to the Recording, Archival and Retrieval CSCI for the Redstone delivery.

Upon notification from the RTPS development personnel, an AP file and recording configuration file will be built. The recording configuration file contains the RTPS IP address/ports and is necessary before recording can be initialized. The Applications File (AP file) is used during retrieval to correlate the FD name to the FDID and obtain information about the FD (i.e. Nomenclature, etc).

The data packets will be archived to storage in the same format as they are received and will be saved to tape.

The retrieval interface will be available to the outside as a series of socket level connections. For Redstone, a user on the HCI will Telnet into the SDC application server to run the DAP applications.

1.2 Recording/Archival and Retrieval Specifications

1.2.1 Recording/Archival and Retrieval Groundrules

The following groundrules and assumptions apply to the Recording, Archival and Retrieval CSCI for the Redstone delivery.

- No redundancy will be provided.
- Support will be provided from the SDC PCC lab.
- All incoming packets will follow the format described in the RTPS Packet Payload ICD.
- No retrieval applications will be developed for this CSCI.
- The "SDC I/F router" software will be used as the interface to the recording function of this CSCI for all data (change and message) recorded.
- An ASCII recording configuration file will be provided that maps the source of the data to the "SDC I/F router" IP address / ports.
- Network connectivity will be provided such that the BIN machines can Telnet to the SDC Application servers to run the DAP applications.
- Network connectivity will be provided such that recorder can connect to the "SDC I/F Router S/W" on ports and address's that are defined in the recording configuration file.
- The FDID shall utilize only 16 bits of the available 18 bit FDID field.
- The FD directory will be available (from the test Build and Control CSCI) to build the AP file.
- Only existing LPS data types will be supported.

1.2.2 Recording/Archival and Retrieval Functional Requirements

The functional requirements apply to the Recording, Archival and Retrieval CSCI for the Redstone delivery and are arranged in the following major/minor functions:

1 Recording

- 1.1 The data recording software shall initiate recording of RTPS data based on a ASCII recording configuration file.
- 1.2 The payload packets shall be recorded exactly as received in the SDC.
- **1.3** The packet data shall be saved to tape and be available for recall at a later date.

2 Retrieval

- 2.1 The following retrieval services shall be provided: (The intent is not to develop a final version of retrieval services but to offer a prototype that will provide some functionality to facilitate CLCS development efforts. The maturity of the service with respect to the final product will depend on the definition of system messages, change data payloads, etc. and the knowledge gained as the system matures.)
  - 2.1.1 Retrieval of raw payload packets based on TCID, source, packet type, start time, start date, stop time, and stop date.
  - 2.1.2 Retrieval of change data in a form that can be utilized by existing DAP applications that are ported to the SDC. These will be based on TCID, FD, start time, start date, stop time, and stop date.
- 2.2 The existing DAP Application Interface will be used for the retrieval service.

2.3 The Packet retrieval application developed for the Juno delivery shall be modified to retrieve any packets described in the RTPS Packet Payload ICD.

2.4 An editor shall create a new AP file from the FD directory and an existing AP file transferred from CDS.

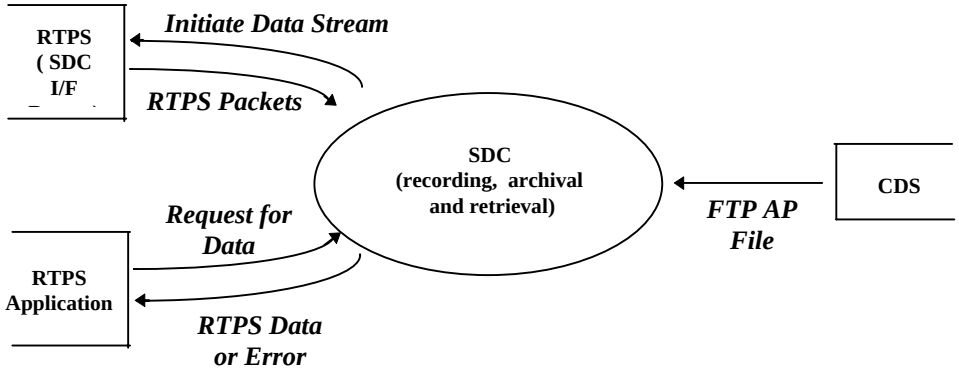
1.2.3 Recording/Archival and Retrieval Performance Requirements

The following performance requirements apply to the Recording, Archival and Retrieval CSCI for the Redstone delivery.

1. The retrieval service shall begin transferring data back to the requester within five seconds upon receipt of the request.
2. The recording function must handle maximum peak and average data rates experienced in RTPS.

1.2.4 Recording/Archival and Retrieval Interfaces Data Flow Diagram

The following Interface Data Flow Diagrams apply to the Recording, Archival and Retrieval CSCI for the Redstone delivery.



- The recording interface consists of the "SDC I/F Router" and the data recorder on the SDC. The recorder will initiate recording by connecting to the "SDC I/F router" IP address/ports listed in the recording configuration file. The SDC I/F router software sends RTPS packets to the recording engine.

- The retrieval interface will use TCP/IP for Redstone. The Reliable Message routines will open a point to point connection from the machine the application is executing on to the SDC user access machines that handle data requests. The retrieval services will be available through different ports.

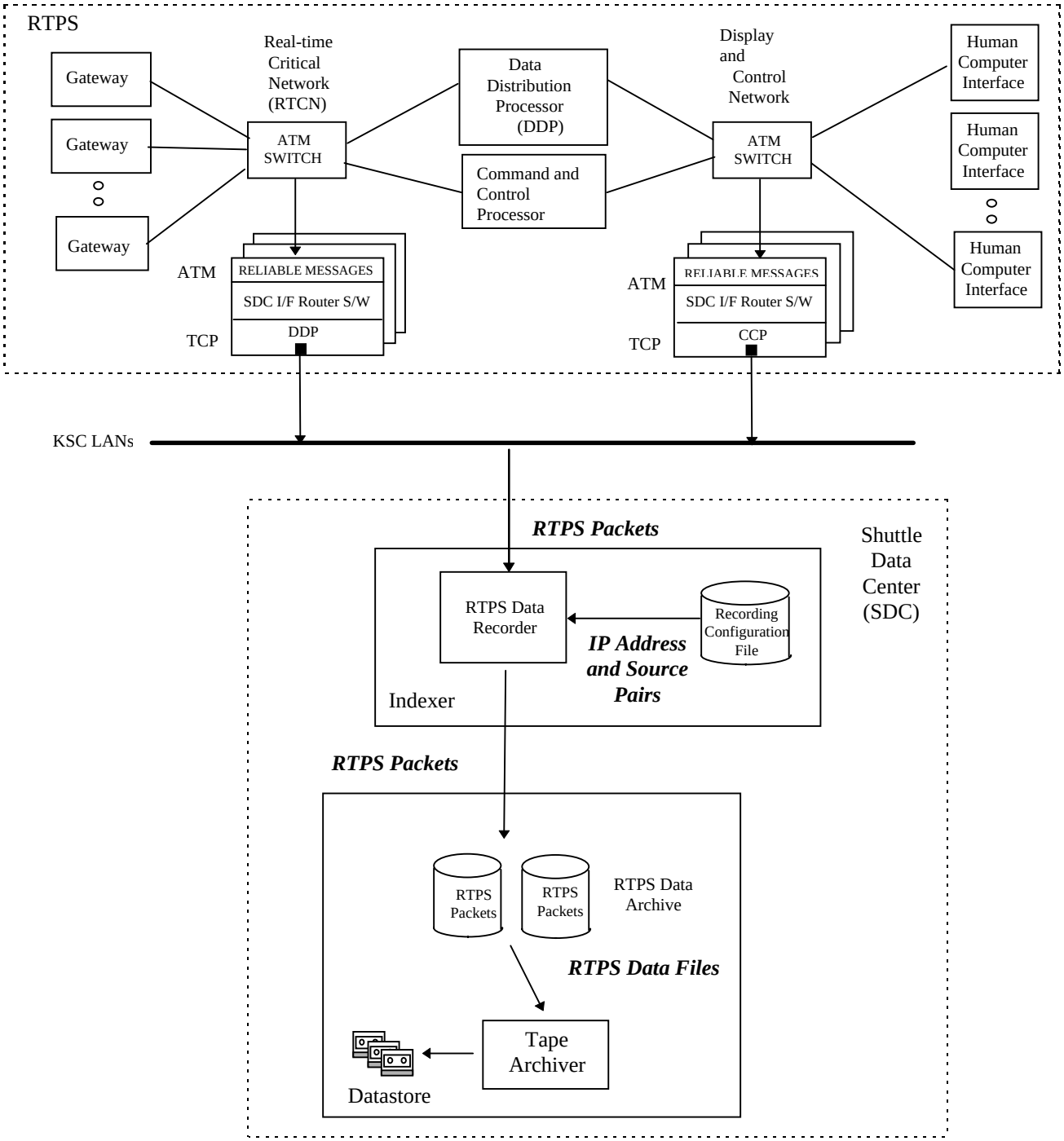
- The SDC will have an interface to CDS so that FTP can be used move the AP file over.

1.3 Recording/Archival and Retrieval Design Specification

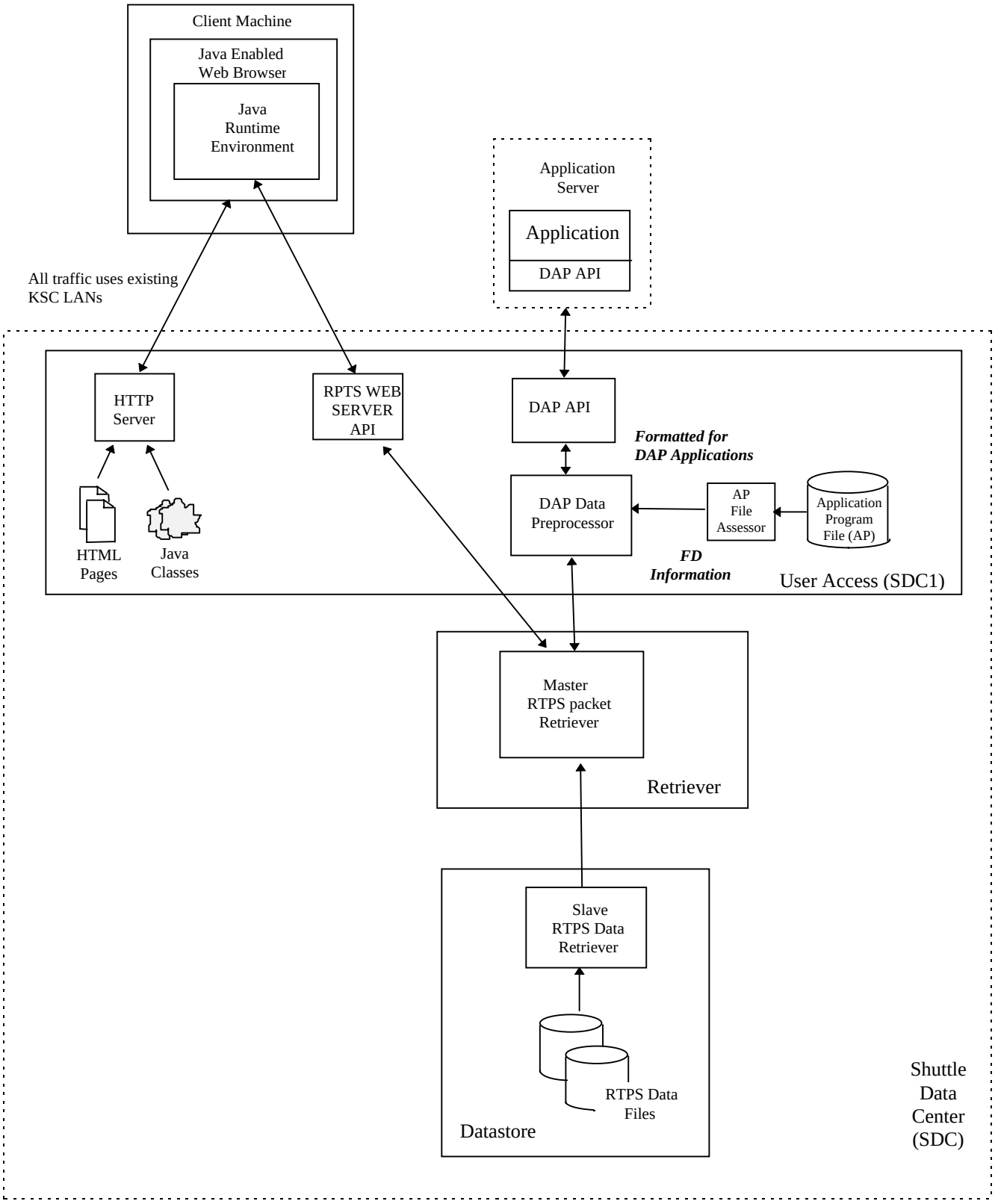
1.3.1 Recording/Archival and Retrieval Data Flow

The following operational description applies to the Recording, Archival and Retrieval CSCI for the Redstone delivery.

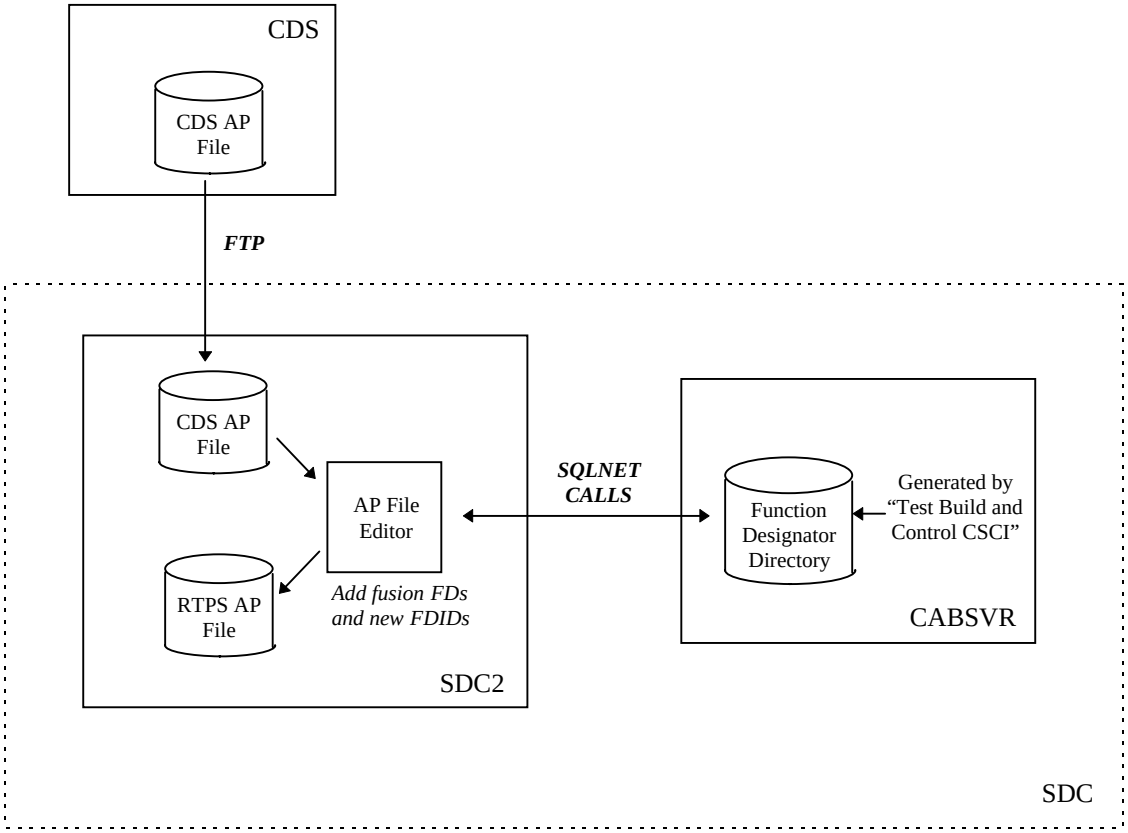
1.3.1.1 Recording Data Flow



1.3.1.2 Retrieval Data Flow



1.3.1.3 AP File Generation Data Flow



1.3.2 Recording/Archival and Retrieval External Interfaces

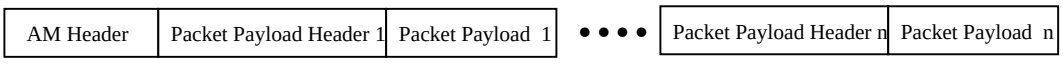
The following operational description applies to the Recording, Archival and Retrieval CSCI for the Redstone delivery.

1.3.2.1 Recording/Archival and Retrieval Data Stream Initialization

The SDC initializes recording by connecting to the addresses and ports opened by the SDC I/F router software. These address / port pairs are supplied by RTPS personnel and will be entered into a file by SDC personnel to be read by the data recorder. After the SDC I/F router software accepts the connection it will begin sending data packets.

1.3.2.2 Recording/Archival and Retrieval Data Stream Format From the RTPS

This is the data stream sent from the SDC I/F router on the RTCN and DCN that is to be recorded in the SDC. This stream will use TCP/IP and all packets will have the AM header followed by the Payload Packet as described in the "RTPS Payload Packet IDC". The following illustrates the format of one packet:

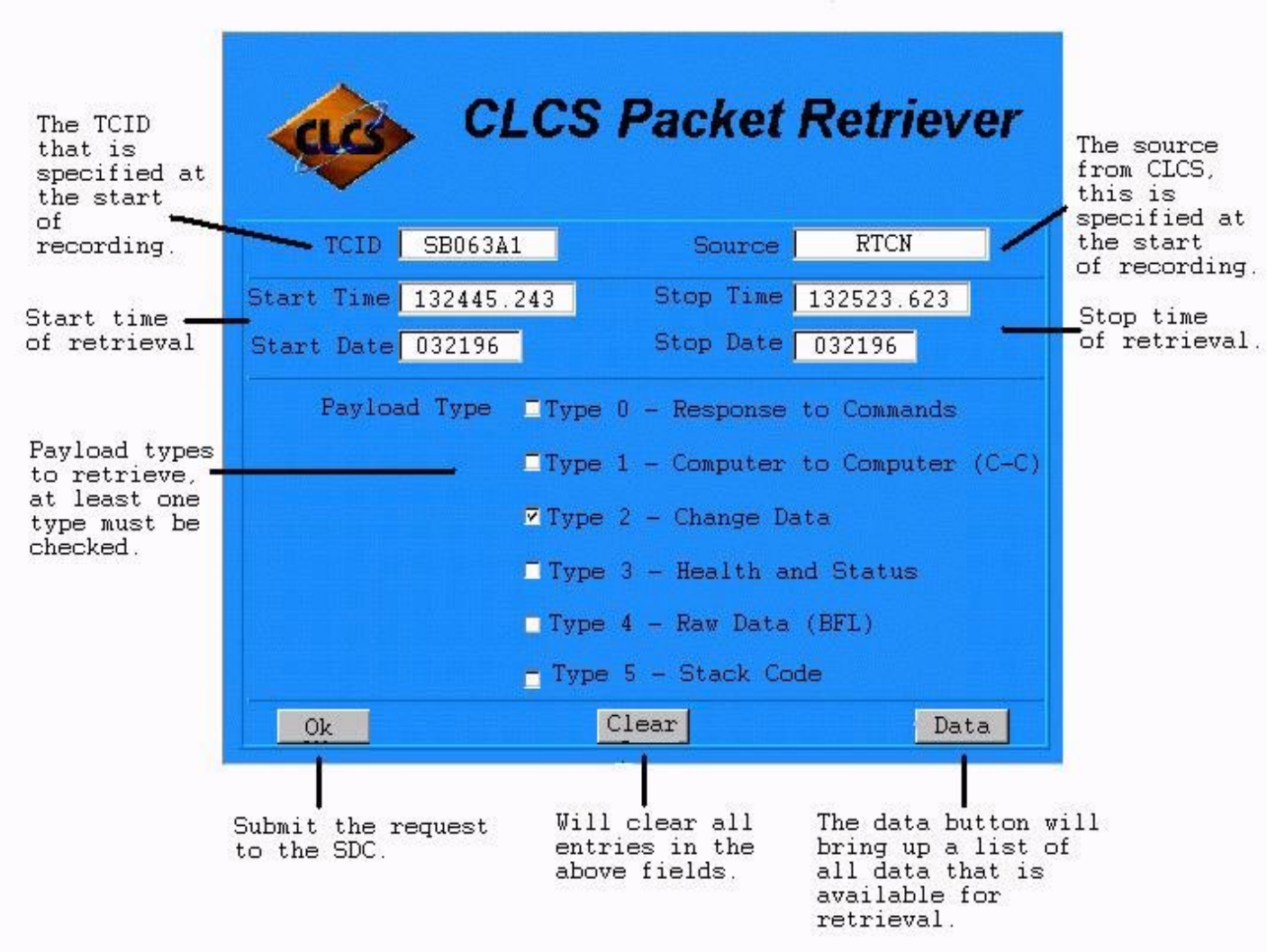


1.3.2.3 Recording/Archival and Retrieval WEB Based Packet Retriever Application

The following operational description applies to the Recording, Archival and Retrieval CSCI for the Redstone delivery.

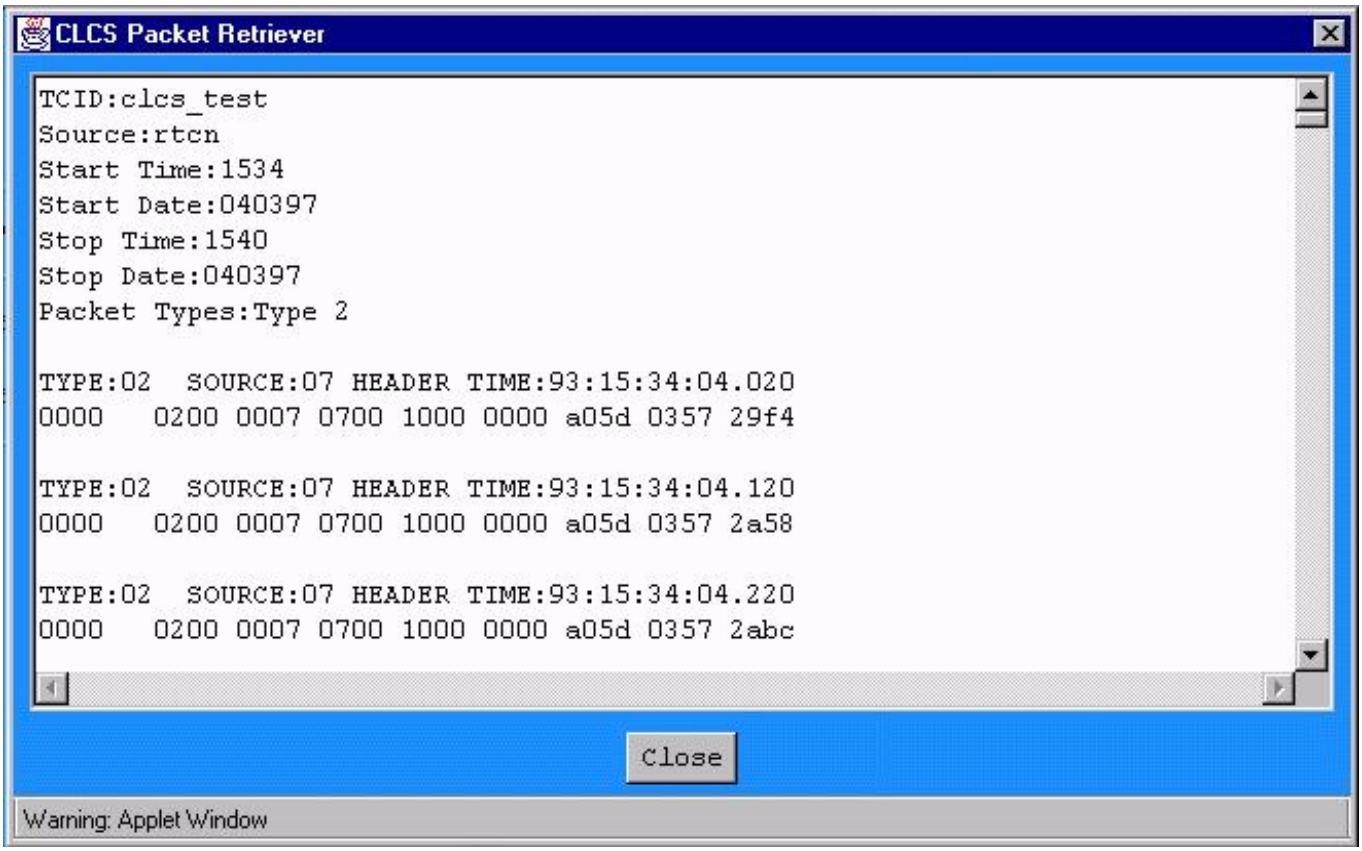
1.3.2.3.1 Recording/Archival and Retrieval Packet Retriever Application Input

This is a screen dump for the Juno packet retriever, this will be modified slightly for Redstone but will follow the same format.



1.3.2.3.2 Recording/Archival and Retrieval Packet Retriever Application Output

This is a screen dump for the Juno packet retriever, this will be modified slightly for Redstone but will follow the same format.



1.3.3 Recording/Archival and Retrieval Test Plan

The DAP application CAP104 will be used to retrieve data from the existing LPS system and from the CLCS system. The results will be compared to ensure the correct results are returned from the CLCS retriever.